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طب بشري

OPHTHALMOLOGY



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Lectures

Lecture No.

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اللجنة العلمية Group C

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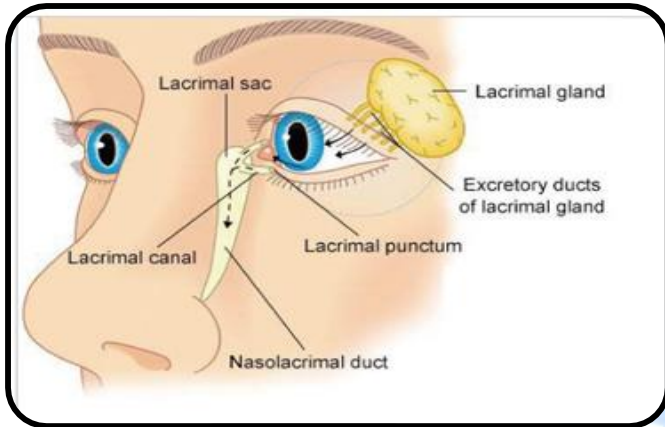
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Lacrimal Apparatus



Anatomy

Lacrimal apparatus consists of:

1. Lacrimal gland.
2. Lacrimal passages

Lacrimal Gland

Main lacrimal gland is located in shallow depression with in orbital part of frontal bone (**orbital part**)

The gland is divided into 2 parts by lateral expansion of levator aponeurosis

1. **Large orbital part.**
2. **Small palpebral part.**

Lacrimal gland are exocrine gland that produce a serous secretion.

Tear film is the secretion of the lacrimal gland consist of:

- I. Outer layer(oily layer)secreted by meibomian gland.
- II. Middle layer (watery layer)secreted from main and accessory glands.
- III. Inner layer (mucous)secretion of goblet cells.

Histology

- The body of each gland contain 2type of cells:

1. Acinar cells: which line the lumen of the gland.
2. Myoepithelial cells which surround the parenchyma and are covered by basement membrane.

Blood supply

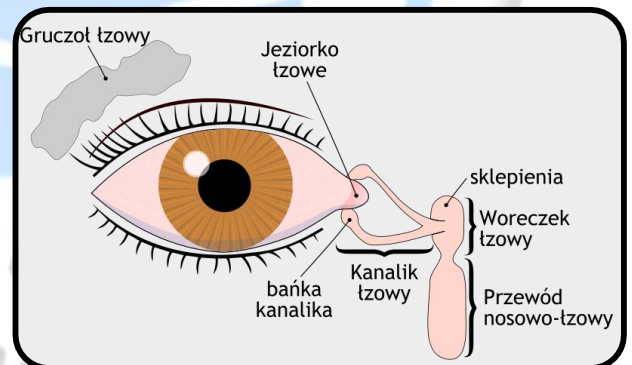
Lacrimal artery which branch of ophthalmic artery.

Nerve supply

- Receives secretomotor (parasympathetic)cholinergic
- Sympathetic nerve fiber in addition to sensory innervation via lacrimal nerve which is branch of trigeminal nerve.
- It also contain alpha adrenergic receptors
- Its extremely complex neuroanatomy governs both reflex and psychogenic stimulation.
-

Accessory Glands

- Gland of karuse and wolfring located at proximal lid border or in the Fornices, and are cytologically identical to the main lacrimal gland
- They receive similar innervation
- Account for approximately 10 % of total lacrimal secretory mass.



Lacrimal Passages

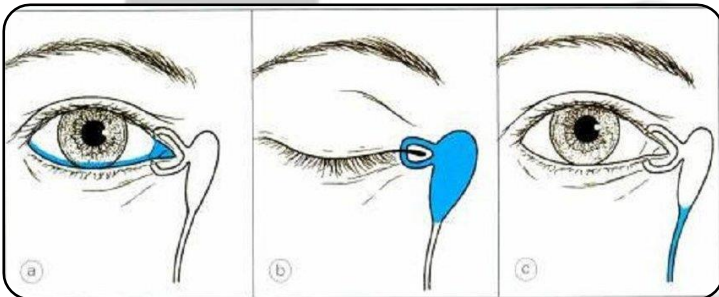
- **The puncta** are located at the posterior edge of the lid margin, at the junction of the lash-bearing lateral five-sixths (pars ciliaris) and the medial non-ciliated one-sixth (pars lacrimalis). Normally they face slightly posteriorly and can be inspected by everting the medial aspect of the lids.
- **The canaliculi** pass vertically from the lid margin for about 2 mm (ampullae). They then turn medially and run horizontally for about 8 mm to reach the lacrimal sac.
- **The lacrimal sac** is 10-12 mm long and lies in the lacrimal fossa between the anterior and posterior lacrimal crests.
- **The nasolacrimal duct** is 12-18 mm long and is the inferior continuation of the lacrimal sac. It descends and

angles slightly laterally and posteriorly to open into the inferior nasal meatus, lateral to and below the inferior turbinate. The opening of the duct is partially covered by a mucosal fold (valve of Hasner).

Physiology

Tears secreted by the main and accessory lacrimal glands pass across the ocular surface. A variable amount of the aqueous component of the tear film is lost by evaporation, with the remainder of the tears hypothesized to drain substantially as follows: Tears flow along the upper and lower marginal strips (Fig. A), pooling in the lacus lacrimalis medial to the lower puncta, then entering the upper and lower canaliculi by a combination of capillarity and suction.

With each blink, the pretarabulbaris oculi muscle compresses the ampullae, hortsens and compresses the horizontal canaliculi, and closes and moves the puncta medially, resisting reflux. Simultaneously, contraction of the lacrimal part of the orbicularis oculi creates a positive pressure that forces tears down the nasolacrimal duct and into the nose, mediated by helically arranged connective tissue fibres round the lacrimal sac (Fig. B). When the eyes open, the canaliculi and sac expand, creating negative pressure that draws tears from the canaliculi into the sac (Fig. C).



Causes Of Watering Eye

- Epiphora is the overflow of tears at the eyelid margin; strictly, it is a sign rather than a symptom. There are two mechanisms:
 1. Hypersecretion secondary to anterior segment disease such as dry eye ('paradoxical watering) or inflammation. In these cases watering is associated with symptoms of the underlying cause, and treatment is usually medical.
 2. Defective drainage due to a compromised lacrimal drainage system this may be caused by:
 - Malposition (e.g. ectropion) of the lacrimal puncta.

- Obstruction at any point along the drainage system, from the punctal region to the valve of Hasner.
- Lacrimal pump failure, which may occur secondarily to lower lid laxity or weakness of the orbicularis muscle (facial nerve palsy).

Nasolacrimal Duct Obstruction

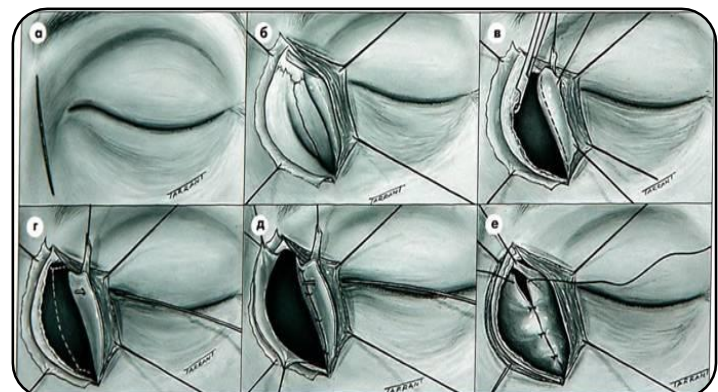
Causes

1. Idiopathic stenosis- by far the most common.
2. Naso-orbital trauma, including nasal and sinus surgery
3. Granulomatous disease such as Wegener's granulomatosis and sarcoidosis.
4. Infiltration by nasopharyngeal tumors.

Treatment

- Conventional (external approach) dacryocystorhinostomy (DCR) is indicated for obstruction distal to the medial opening of the common canaliculus, and consists of anastomosis of the lacrimal sac to the mucosa of the middle nasal meatus. The procedure is usually performed under hypotensive general anaesthesia. A vertical skin incision is made 10 mm medial to the inner canthus, the medial canthal tendon and lacrimal sac exposed and reflected, and after removal of the intervening bone the sac is incised and attached to an opening created in the nasal mucosa (Fig.). The success rate is over 90%; causes of failure include inadequate size and position of the ostium, unrecognized common canaliculus.
- Obstruction, scarring and the sump syndrome in which the surgical opening in the lacrimal bone is too small and too high. Complications include cutaneous scarring, injury to medial canthal structures, haemorrhage, infection and cerebrospinal fluid rhinorrhea if the subarachnoid space is inadvertently entered

Dacryocystorhinostomy



Congenital obstruction

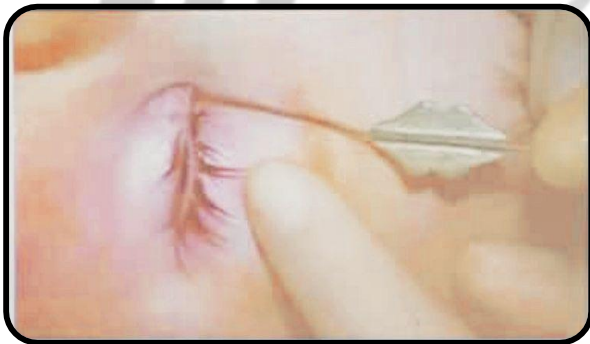
- The lower end of the nasolacrimal duct, in the region of the valve of Hasner, is the last portion of the lacrimal drainage system to canalize with complete patency most commonly occurring soon after birth.
- Epiphora affects at least 20% of neonates, but spontaneous resolution occurs in over 95% within the first year, it has been suggested that early epiphora with resolution may be regarded as a normal variant.

Signs

Epiphora and matting of eyelashes may be constant or intermittent, and may be particularly noticeable when the child has an upper respiratory tract infection.

Congenital Dacryocoele

A congenital dacryocoele (amniotocoele) is a collection of amniotic fluid or mucus in the lacrimal sac caused by an imperforate Hasner valve. Presentation is perinatal with a bluish cystic swelling at or below the medial canthus (Fig. 2.17), accompanied by epiphora. If an intranasal component is large it can cause respiratory distress. It should not be mistaken for an encephalocoele, the latter being characterized by a pulsatile swelling above the medial canthal tendon. Resolution is common with only conservative treatment, but if this fails, probing is usually adequate.



Congenital dacryocoele



Acute Dacryocystitis

. Presentation is with the subacute onset of pain in the medial canthal area, associated with epiphora. A very tender, tense red swelling develops at the medial canthus commonly progressing to abscess formation there may be associated preseptal cellulitis.

Treatment

- o Initial treatment involves the application of warm compresses and oral antibiotics such as flucloxacillin or co amoxiclav; irrigation and probing should not be performed.
- o Incision and drainage may be considered if pus points and an abscess is about to drain spontaneously. However, this carries the risk of a persistent sac-skin fistula.

Acute dacryocystitis



Chronic Dacryocystitis

Presentation is with chronic epiphora, which may be associated with a chronic or recurrent unilateral conjunctivitis. A mucocoele is usually evident as a painless swelling at the inner canthus (but if an obvious swelling is absent pressure over the sac commonly still results in mucopurulent canalicular reflux (Treatment is with a dacryocystorhinostomy; the enlarged sac often makes this technically easier

(A) Mucocoele; (B) expression of mucopurulent material

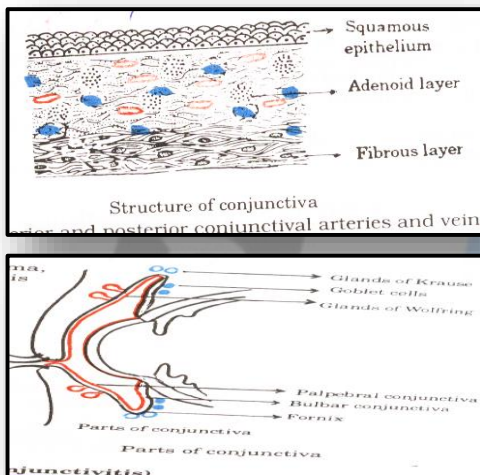


The Conjunctiva

Dr. Sameha ALeryani

Applied anatomy

- 1 Thin, translucent, vascular mucous membrane
- 2 Parts
- 3 Structure
- 4 Blood supply
- 5 Lymphatic drainage
- 6 Nerve supply



Diseases Of The Conjunctiva

1. Inflammation (conjunctivitis)
2. Degenerative conditions
3. Symptomatic conditions
4. Cysts & tumors

Inflammations

- Infective types
 1. Acute: serous, catarrhal, mucopurulent, purulent, membranous.
 2. Chronic: angular, follicular, trachoma
- Allergic types:
 1. Acute
 2. Phlyctenular
 3. Spring catarrh or vernal conjunctivitis

Evaluation by:

- 1 Discharge
- 2 Conjunctival reactions
- 3 Lymphadenopathy

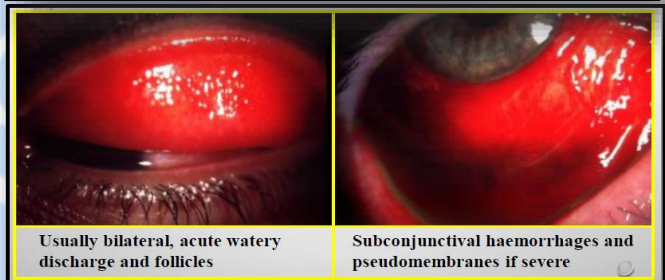
Discharge:

1. Watery
2. Mucin
3. Mucopurulent
4. Purulent

Conjunctival reactions:

1. Hyperemia
2. Oedema
3. Follicle
4. Papilla
5. Membrane: true & false.

Signs of conjunctivitis



Usually bilateral, acute watery discharge and follicles

Subconjunctival haemorrhages and pseudomembranes if severe

Treatment: Symptomatic



Figure 3.2 Conjunctival follicles



Figure 3.5 Severe chemosis

➤ Diagnosis : confirmed by:

1. Bacteriological examinations
2. Histological examinations
3. Conjunctival culture

Treatment of conjunctivitis

1. Antibiotics drops
2. Antibiotics ointments

CONJUNCTIVAL INFECTIONS

1. Bacterial

- Simple bacterial conjunctivitis
- Gonococcal keratoconjunctivitis

2. Viral

- Adenoviral keratoconjunctivitis
- Molluscum contagiosum conjunctivitis
- Herpes simplex conjunctivitis

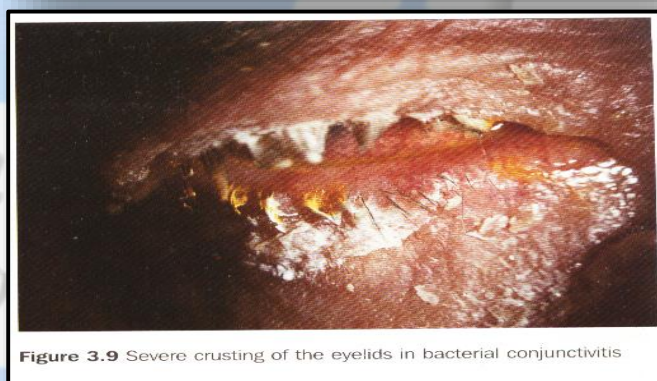
3. Chlamydial

- Adult chlamydial keratoconjunctivitis
- Neonatal chlamydial conjunctivitis
- Trachoma

Acute conjunctivitis

1-Acute mucopurulent conj.

- **Etiology:** staph. strept. pneum.,.
- **Incidence:** epidemics, bilateral, spreads by (fingers, flies& fomites), self-limiting.
- **Symptoms:** redness, grittiness, m.p discharge, sticking lids, coloured halos.
- **Signs:** c. congestion, chemosis, haemorr.
- **Treatment:** cleanliness, control of infection
- **Prophylaxis.**

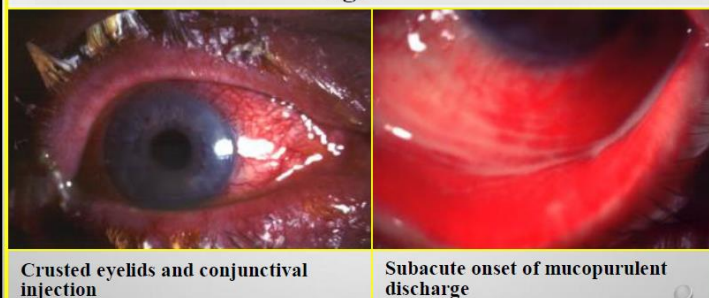


Acute purulent conjunctivitis

- **Etiology:** gonococcus, staph., strep. diphtheriae
- **Incidence:** males commonly, associated with urethritis
- **Symptoms:** much swelling of the lids& conj. purulent discharge, increase in body temperature.
- **Signs:** marked congestions, severe chemosis, swollen lids, pseudomembrane & preauricular lymphadenopathy.
- **Complications**
- **Treatment & prophylaxis.**

Simple Bacterial Conjunctivitis

Signs



Treatment: broad-spectrum topical antibiotics

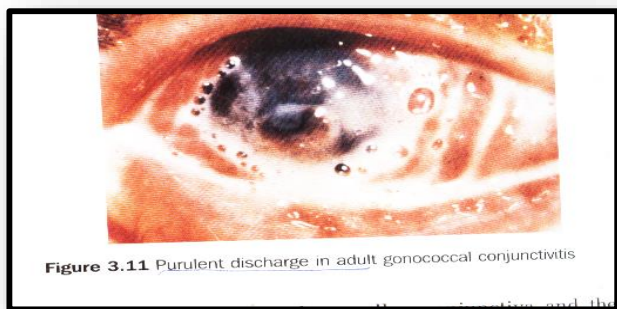


Figure 3.11 Purulent discharge in adult gonococcal conjunctivitis

Gonococcal Keratoconjunctivitis

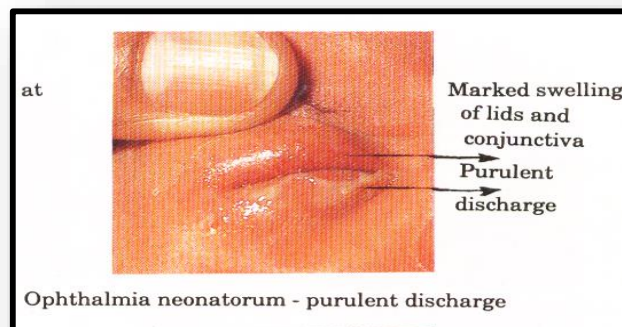
Signs	Complications
	
Acute, profuse, purulent discharge, hyperaemia and chemosis	Corneal ulceration, perforation and endophthalmitis if severe

Treatment:

- Topical gentamicin and bacitracin
- Intravenous cefoxitin or cefotaxime

Ophthalmia Neonatorum

- A preventable dis. Occurring in newborn.
- **Etiology:** gonoc. 50%, other organisms.
- **Incidence:** bilateral, commonly in newborns due to maternal infection
- **Symptoms:** discharge (1st week), conj. is bright red swollen with thick yellow pus & sticking lids.
- **Complications:** c. ulcer, perforation, endo & panophthalmitis.
- **Treatment:** as in adult with parenteral antibiotics for 3-5 days.
- **Prophylaxis:** aseptic delivery, proper antenatal care.



Ophthalmia neonatorum - purulent discharge

Neonatal Chlamydial Conjunctivitis

- Presents between 5 and 19 days after birth
- May be associated with otitis, rhinitis and pneumonitis.



Mucopurulent papillary conjunctivitis

Treatment: topical tetracycline and oral erythromycin

Membranous Conjunctivitis (Diphtheritic Conjunctivitis)

- Conj. Surface covered by a fibrinous membrane
- **Etiology:** c. diphtheriae is the most common pathogen, gonoc, pneum., strept.
- **Incidence:** nonimmunised child., also in weak child. mainly after measles.
- **Symptoms:** swollen lids & serous or mucopurulent discharge.
- **Signs:** lids swollen red, tender, impaired mobility, on evertng lids white membrane covering conj. & not easily peel off even with bleeding on peeling, preauricular nodes, throat infection & fever.

Complications:

- c. ulcer, symblepharon, postdiphtheritic paralysis.
- **Treatment:** every case with membrane should be treated as diphth. Unless c. swabs & culture are negative
- Local & systemic penicillin
- injection of antidiphtheritic serum (4-6-1000 units repeated in 12h) with isolation.

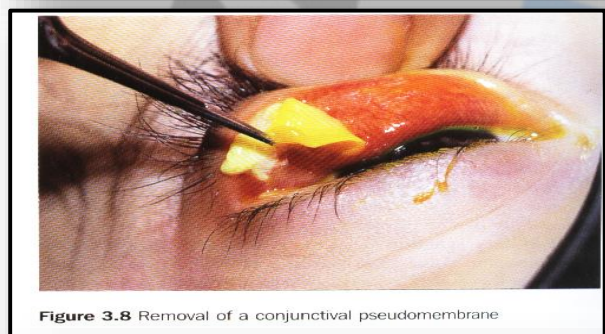


Figure 3.8 Removal of a conjunctival pseudomembrane

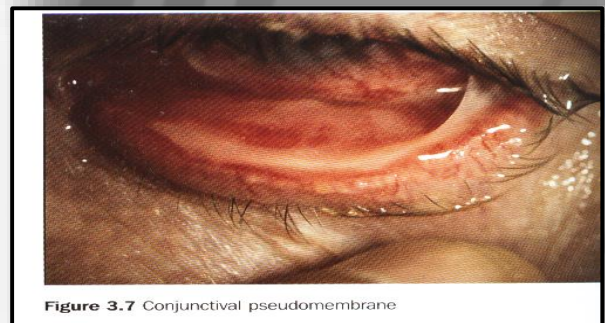


Figure 3.7 Conjunctival pseudomembrane

Chronic Conjunctivitis**1-simple chronic conj.**

- **Etiology:** irritation, misplaced eye lashes, dacryocystitis, retained f.b. blepharitis.
- **Symptoms:** discomfort, grittiness, difficulty in keeping the lids open, mild serous discharge.
- **Signs:** congestion of fornices with papillae in palpebral conj.
- **Treatment:** treat the cause.

2-Angular conjunctivitis

- Reddening mainly in intermarginal strip of bulbar conj.
- **Etiology:** Morax-Axenfield diplobacillus
- **Symptoms:** red eye, discomfort, frequent blinking, mild m.p. discharge.
- **Signs:** reddening of intermarginal strip, excoriation of skin at outer & inner canthi.
- **Complications:** blepharitis, marginal or central c. ulcer, recurrences are common.
- **Treatment:** tetracycline ointment is the drug of choice & zinc oxide ointment also may be used.

Trachoma

A specific communicable keratoconjunctivitis usually of chronic evolution caused by Chlamydia trachomatis agent, characterized by the formation of follicles, papillary hyperplasia and pannus.

Aetiological Agent

It is one of the Chlamydia group which have characteristics half way between bacteria and viruses. Like bacteria they multiply by binary fission and have some sort of cellular organization. They are also sensitive to certain antibiotics especially the sulphonamides and the tetracyclines.

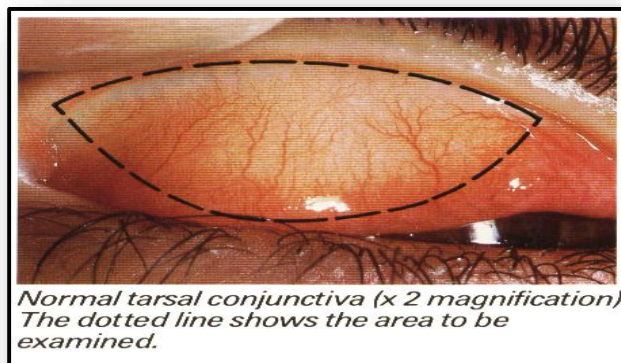
Stages Of Trachoma

According to WHO classification trachoma is classified to five stages:

- 1-Follicular stage.
- 2-Intense stage
- 3-Scarring stage
- 4-Trichiasis stage
- 5-Opacity stage

1-Follicular Stage (TF)

The presence of five or more follicles in the upper tarsal conjunctiva. Follicle is a round swelling that is paler than the surrounding conjunctiva, appearing white, gray or yellow. Follicles must be at least 0.5mm in diameter.



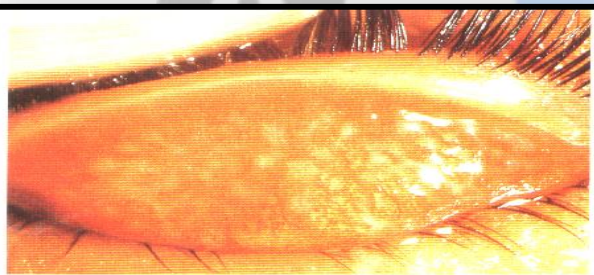
Normal tarsal conjunctiva (x 2 magnification). The dotted line shows the area to be examined.



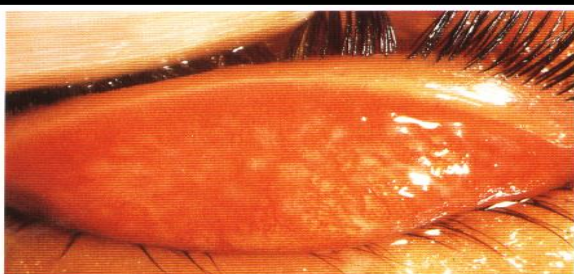
Trachomatous inflammation – follicular (TF).

2-Intense stage (TI)

Pronounced inflammatory tarsal conjunctiva that obscures more than half of the normal deep tarsal vessels. The conjunctival tissue appears red, rough and thickened. There are usually numerous follicles, which may be partially or totally covered by the thickened conjunctiva.



Trachomatous inflammation – follicular and intense (TF + TI).



Trachomatous inflammation – follicular and intense (TF + TI).

3- Scarring stage (TS)

Scars are easily visible as white lines, bands or sheets in the tarsal conjunctiva. They are glistening and fibrous in appearance.

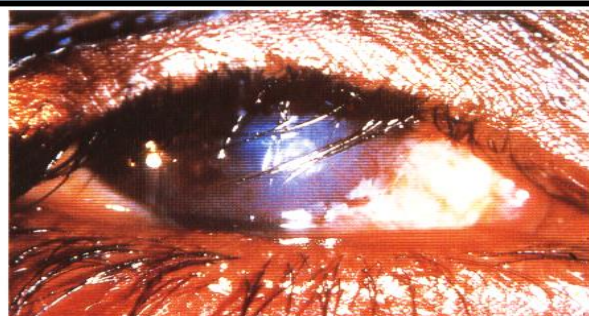
Scarring, especially fibrosis may obscure the tarsal blood vessels.



Trachomatous scarring (TS)

4- Trichiasis stage (TT)

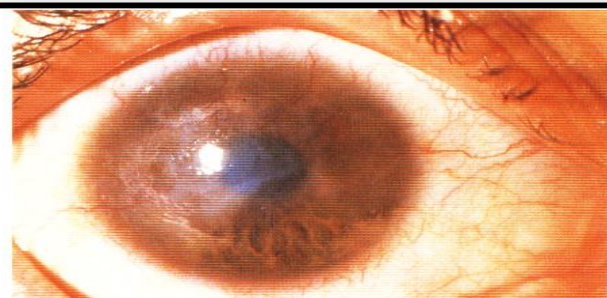
At least one eyelash rubs on the eyeball. Evidence of recent removal of intumed eyelashes should also be graded as trichiasis.



Trachomatous trichiasis (TT)

5- Opacity stage (CO)

Easily visible corneal opacity over the pupil. The pupil margin is blurred viewed through the opacity. Such corneal opacities cause significant visual impairment (less than 6/18 or 0.3 vision).



Corneal opacity (CO)

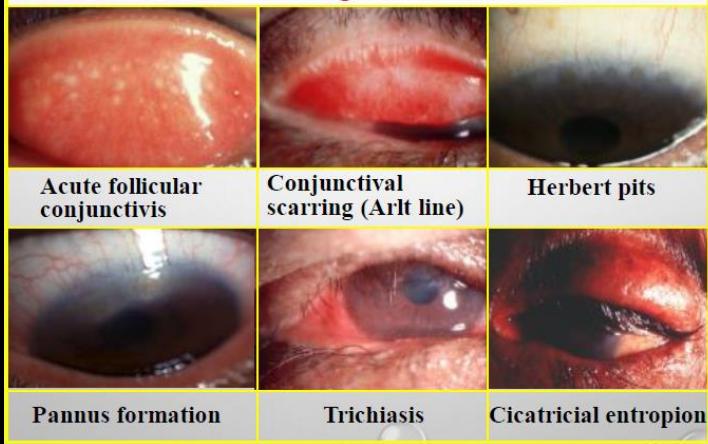
➤ Sequele and complications of trachoma:

1. Trichiasis
2. Entropion
3. Corneal Ulcer
4. Corneal Opacity
5. Ptosis
6. Xerosis
7. Blindness

Trachoma

- Infection with serotypes A, B, Ba and C of Chlamydia Trachomatis.
- Fly is major vector in infection-reinfection cycle.

Progression



Treatment - systemic azithromycin

➤ Treatment of trachoma:

1. Medical treatment:
 - Local & systemic (tetracyclins, sulphacetamides, azithromycin).
2. Surgical treatment: for complicated cases.

ALLERGIC CONJUNCTIVITIS

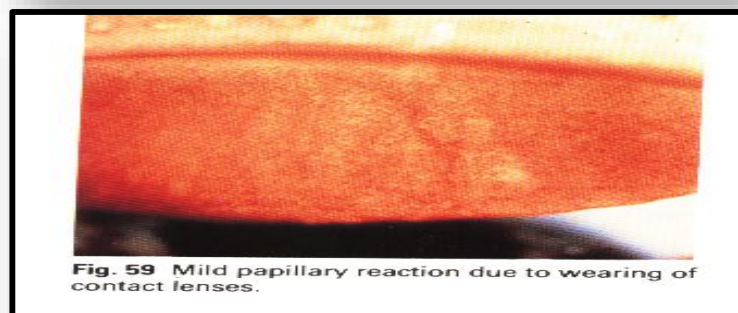
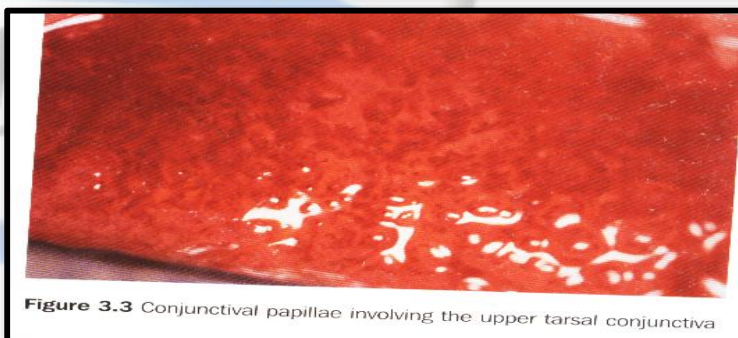
1. Allergic rhinoconjunctivitis
2. Vernal keratoconjunctivitis
3. Atopic keratoconjunctivitis

1-Acute Allergic Conj.

- **Etiology:** non-specific allergen (either endogenous or exogenous)
- **Symptoms:** itching, watery secretion, marked redness, skin of lid is swollen & red.
- **Treatment:** treat the cause.

Allergic Rhinoconjunctivitis

- Hypersensitivity reaction to specific airborne antigens
- Frequently associated nasal symptoms
- May be seasonal or perennial



2-Phlyctenular Conj.

- An allergic react. Of conj. caused by endogenous protein with formation nodule near the limbus.
- **Etiology:** T.B, tonsils, adenoids, etc.
- **Incidence:** 4-14Y, unhygienic conditions, malnutrition.
- **Symptoms:** discomfort. irritation, itching, reflex Lacrimation.
- **Signs:** small nodule (yellow-gray, 1-3mm) seen in bulbar conj. Near limbus with congestion around it.
- **Treatment:** cause+steroids

Allergic Conjunctivitis

3-Spring Catarrh (Vernal Conj.)

- Recurrent, bilateral/ seasonal conjunctivitis occurring with the onset of hot weather.
- **Etiology:** exogenous allergen as pollens & dust & mediated by IgE.
- **Incidence:** young boys (5-10y), bilateral, recurrent usually occurs at onset of hot weather.
- **Symptoms:** itching, thick white ropy mucous discharge, F.B. sensation, photophobia, lacrimation.

Vernal Keratoconjunctivitis

Frequently associated with atopy: asthma, hay fever and dermatitis



- Recurrent, bilateral
- Affects children and young adults
- More common in males and in warm climates
- Itching, mucoid discharge and lacrimation

Types

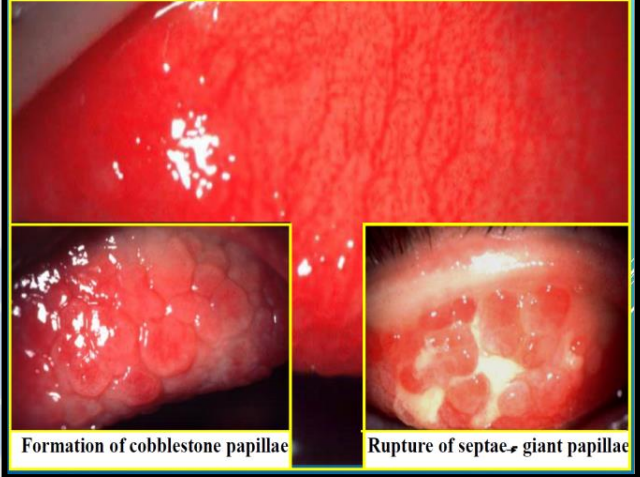
- Palpebral
- Limbal
- Mixed

Treatment

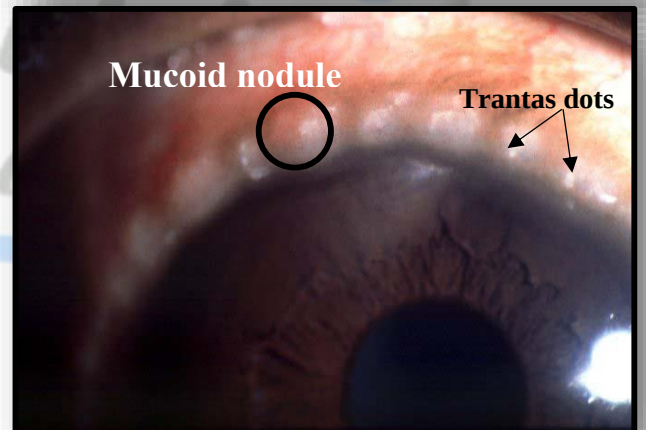
- Topical mast cell stabilizers
- Topical steroids

Progression of vernal conjunctivitis

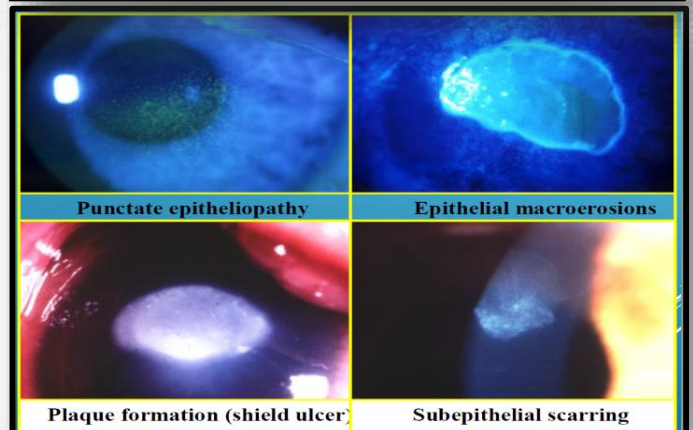
Diffuse papillary hypertrophy, most marked on superior tarsus



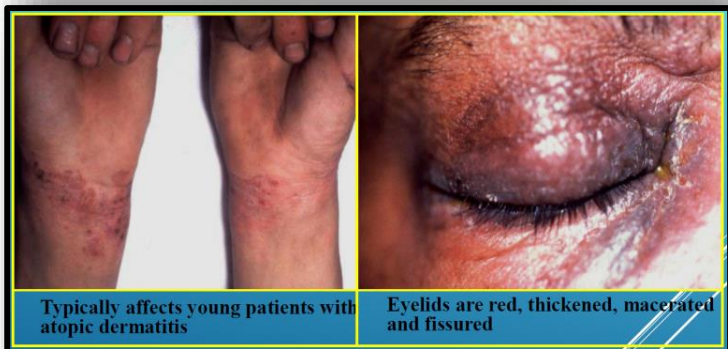
Limbal Vernal



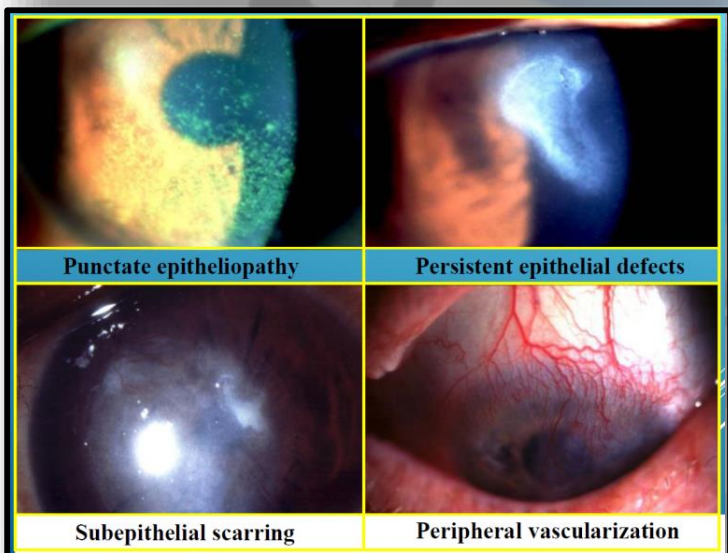
Progression Of Vernal Keratopathy



Atopic keratoconjunctivitis



Progression of atopic keratopathy



Allergic Conjunctivitis

3-Spring Catarrh (Vernal Conj.)

➤ **Types:** two typical forms:

1. Palpebral form:

- Conj. chemosis
- On everting upper lid shows diffuse papillary hypertrophy (cobblestones like appearance).

2. Bulbar form:

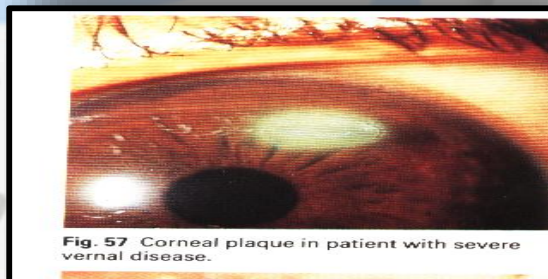
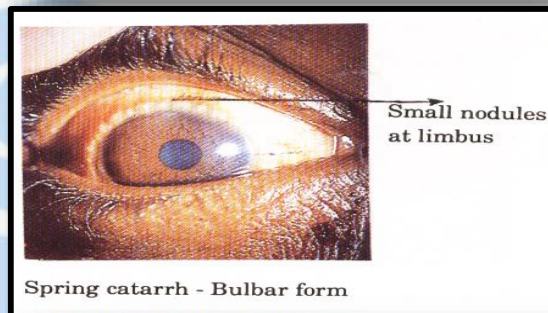
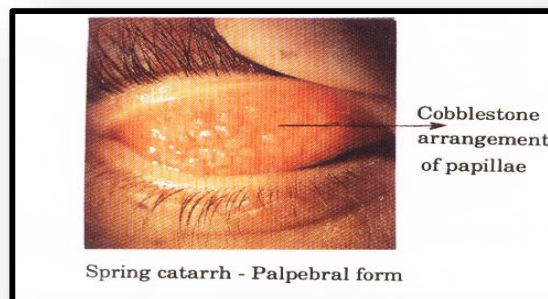
- M. nodules. gelatinous thickening in the upper part of the limbus.
- White spots (trant's spots) of eosinophils seen at limbus.

➤ **Complications:**

1. Keratopathy
2. Ptosis
3. Glaucoma & cataract 2ry to longstanding treatment.

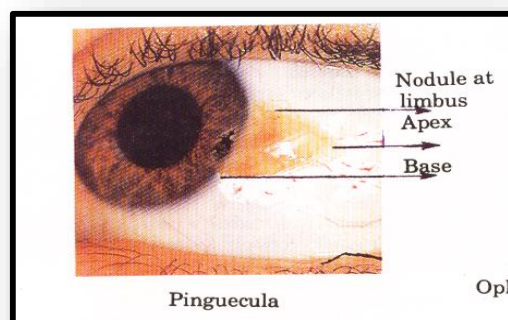
➤ **Treatment:** purely symptomatic:

1. Topical steroids
2. Disodium cromoglycate 2%
3. Non-steroidal anti-inflammatory drugs.



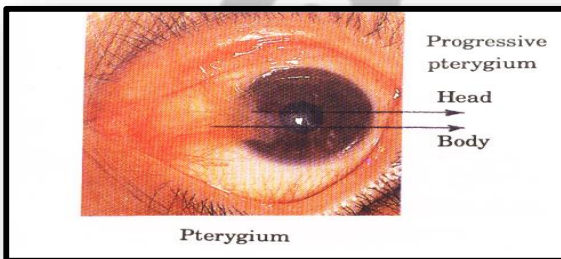
Degenerations -Pinguecula

- Triangular yellow patch on conj. near limbus.
- **Etiology:** elderly persons, dust, sunlight
- **Signs:** triang. Patch on nasal side in palpebral conj.
- **Pathology:** hyaline degeneration.
- **Treatment:** no treatment.



Degenerations-Pterygium

- ▶ Triangular sheet of fibro vascular tissue invades cornea.
- ▶ **Parts:** head, neck & body.
- ▶ **Pathology:** u/v sensitivity to conjunctiva
- ▶ **Incidence:** nasal side 1st, may be bilateral.
- ▶ **Symptoms:** cosmetic, impaired vision (astigmatism), rarely diplopia.
- ▶ **Course:**
 1. Progressive stage
 2. Atrophic stage
- ▶ **D/D:** pseudopterygium
- ▶ **Treatment:** surgical .



Symptomatic Conditions

1. **Subconjunctival Haemorrhage**
 - ▶ Causes:
 1. Trauma
 2. Spontaneous
 3. Severe conjunctivitis
 4. Mechanical straining
 5. Bleeding disorders head injury etc.
2. **Xerosis (Dry Eye)**
 - ▶ It is a dry, lusterless cond. Of conj. Due to the unstable tear film, exposing the conj. & corneal epithelium to evaporation
 - ▶ **Causes:**
 1. Deficiency of tears sjogren's syndrome
 2. Deficiency of conjunctival mucus:
 - Trachoma
 - Avitaminosis A
 - Burns
 - Steven-johnson syndrome
 - W.H.O classification of xerophthalmia (vit. A deficiency):
 - ▶ **PRIMARY SIGNS:**
 1. X1A conj. Xerosis
 2. X1B Bitot's spots
 3. X2 Corneal xerosis

4. X3A Corneal ulceration with xerosis 1/3 corneal surface
 5. X3B keratomalacia >1/3 corneal surface
- W.H.O classification of xerophthalmia (vit. A deficiency):

Secondary signs:

1. XN Night blindness
2. XF Xerophthalmia fundus (pale yellow spots)
3. XS Xerophthalmia scars

Cysts & Tumors

1-Cysts

1. Epithelial implantation cysts
2. Retention cysts
3. Hydatid cysts rare

2-Tumours

1. Dermoid
2. Dermolipoma
3. Papilloma
4. Simple granuloma
5. Squamous cell carcinoma
6. Pigmented tumours

CONJUNCTIVAL TUMOURS

1. Benign

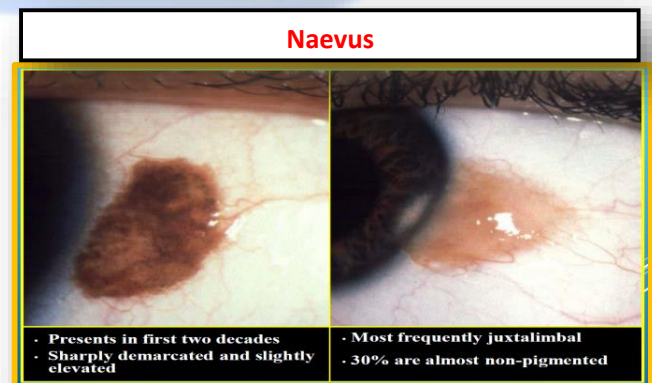
- Naevus
- Papilloma
- Epibulbar dermoid
- Lipodermoid

2. Pre-malignant

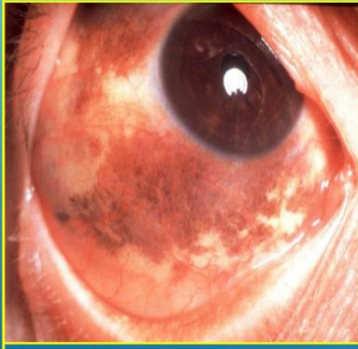
- Primary acquired melanosis (PAM)
- Intraepithelial neoplasia (carcinoma *in situ*)

3. Malignant

- Melanoma
- Squamous cell carcinoma
- Kaposi sarcoma
- Lymphoma



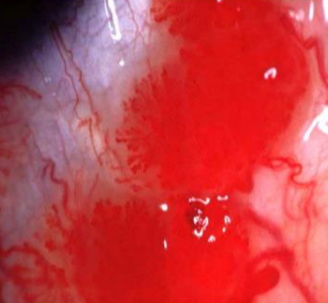
Papilloma

Signs	Types
	
• Presents in late adulthood • Unilateral, irregular areas of flat, brown pigmentation • May involve any part of conjunctiva	• PAM without atypia is benign • PAM with atypia is pre-malignant

Squamous Cell Carcinoma

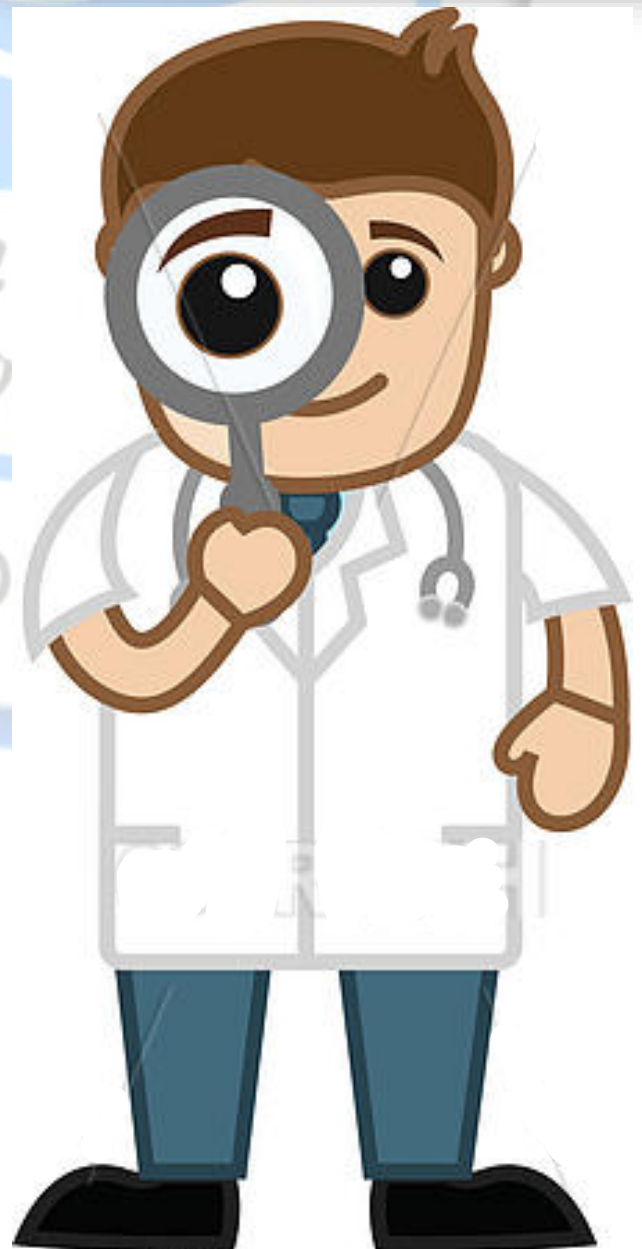
Signs	Progression
	
• Arises from intraepithelial neoplasia or <i>de novo</i> • Presents in late adulthood • Frequently juxtalimbal	• Slow-growing • May spread extensively • Rarely metastasizes

Primary Acquired Melanosis (PAM)

Pedunculated	Sessile
	
• Presents in childhood or early adulthood • Infection with papilloma virus • May be multiple and bilateral	• Presents in middle age • Not caused by infection • Single and unilateral

Conjunctival Melanoma

From PAM with atypia	From naevus	Primary
		
• Most common type • Sudden appearance of nodules in PAM	• Very rare • Sudden increase in size or pigmentation	• Solitary nodule • Frequently juxtalimbal but may be anywhere



Ocular Pharmacology

DR AMAL NOMAN AL-DBHANY

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FRCS – Glasgow

Msc(Oph) - Ain Shams University - Egypt



Route Of Administration

Topical ocular medication:

- The most effective
- The most Commonly used ROA in ophthalmology

Systemic ocular medication:

- Have poor absorption to the eye
- Require high doses
- Have many adverse effects
- Effective for lid and orbit

Topical

- Drop
- Ointment
- Gel
- Soft contact lens



Periocular

- Subconjunctival
- Subtenon
- Peribulbar
- Retrobulbar
- Soft contact lens(Bandage)

Intraocular

- Intracameral
- Intravitreal

Systemic

- Oral
- Intravenous
- Intramuscular



Metabolism & Pharmacokinetics

Topical eye medication

Eye drops:

- Simplest and more convenient
- Mainly for day time use
- 1 drop=50 microlitre
- Conjunctival sac capacity=7-13 micro liter
- So, even 1 drop is more than enough

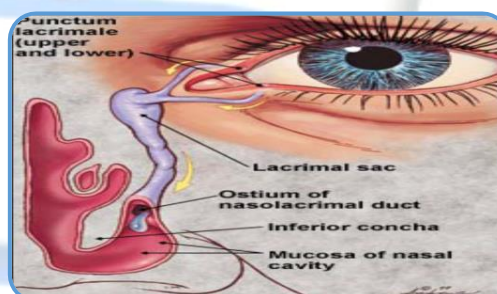
❖ Method:

- Hold the skin below the lower eye lid
- Pull it forward slightly
- Instill 1 drop



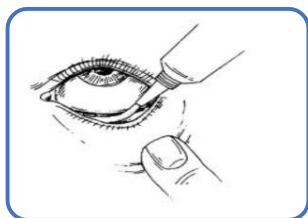
❖ Measures to increase drop absorption:

- Wait 5-10 minutes between drops
- Compress lacrimal sac
- Keep lids closed for 5 minutes after instillation
- ❖ 50% drug remains 4 min. after instillation
- ❖ 10% drug reach aqueous humour
- ❖ Compress NLD to decrease systemic (Atropine drops in paediatrics)



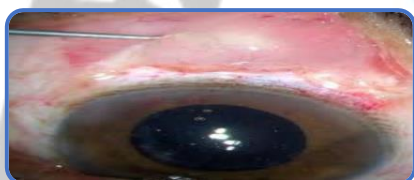
Ointments

- Increase the contact time of ocular medication to ocular surface thus better effect
- It has the disadvantage of vision blurring, so better be given at bedtime

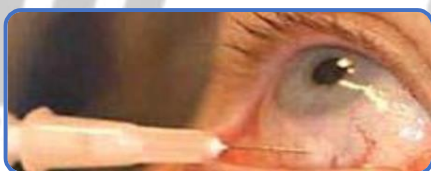


Periocular Injections

- Reach behind iris-lens diaphragm better than topical application
- Bypasses the conjunctival and corneal epithelium which is good for drugs with low lipid solubility (e.g. penicillins)
- Steroid and local anesthetics can be applied this way



Subconjunctival



Subtenon



Retrobulbar

•Intracameral or intravitreal

- E.g.
 - Intracameral acetylcholine (miochol) during cataract surgery.
 - Intravitreal antibiotics in cases of endophthalmitis.
 - Intravitreal steroid in macular edema.
 - Intravitreal Anti-VEGF for DR.
 - Distance from limbus for intravitreal injection:
 - 4 mm phakic, 3.5 mm pseudophakic , 3 mm aphakic.



Systemic eye medications

- Oral or IV, IM, SC
- Poorly penetrate due to tight junction of retinal vascular endothelium → blood-ocular barrier
- More penetration with ocular inflammation



Common Ocular Drugs

1. Antibacterials (antibiotics)
2. Antivirals
3. Antifungal
4. Mydriatics and cycloplegics
5. Antiglaucoma
6. Anti-inflammatory agents: Corticosteroids & NSAIDs
7. Ocular Lubricants
8. Antihistaminics
9. Ocular diagnostic drugs
10. Local anesthetics



1. Fluorescence
2. Rose Bengal

Antibacterials (Antibiotics)

1. Penicillins
2. Cephalosporins
3. Sulfonamides
4. Tetracyclines
5. Chloramphenicol
6. Aminoglycosides
7. Fluoroquinolones
8. Vancomycin
9. Macrolides

Antibiotics

- Used topically in prophylaxis (pre and postoperatively) and treatment of ocular bacterial infections.
- Used orally for the treatment of preseptal cellulitis e.g. amoxicillin with clavulonate, cefaclor
- Used intravenously for the treatment of orbital cellulitis e.g. gentamicin, cephalosporin, vancomycin, flagyl
- Can be injected intravitally for the treatment of endophthalmitis



Orbital Cellulitis



Endophthalmitis

Antibiotics: Fluoroquinolones:

- Commonly used in ophthalmological infections



✓ 1st generation

- Active against G- (not Pseudomonas spp)

✓ 2nd generation

- Ciprofloxacin, ofloxacin, lomefloxacin
- Active against G- including Pseudomonas spp, some G+
- Not active against Strep pneumoniae

✓ 3rd generation

- Levofloxacin
- Same as 2nd
- Active against more G+, Strep pneumoniae

✓ 4th generation

- Gatifloxacin (Zymar®), moxifloxacin (Vigamox®)
- Same as 3rd, active against anaerobe
- Useful in bacterial conjunctivitis, corneal ulcer

الاسماء التجارية للاطلاع فقط

Antibiotics: Amino glycosides:

- Mainly against Gm negative bacilli
- Bacterial protein synthesis inhibitors
 - Gentamycin—0.3% eye drop
 - Tobramycin- Pseudomonas 1% eye drop
 - Neomycin—0.3-0.5% eye drop

Fusidic acid eye drops & ointment:

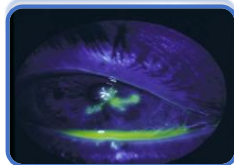
- indicated for the topical treatment of bacterial conjunctivitis & for styne



Antivirals

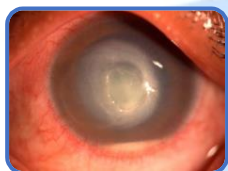
Acyclovir

- Inhibits viral DNA synthesis
- Active against HSV I & II, HZV
- Oral, ointment
- Used in herpetic keratitis



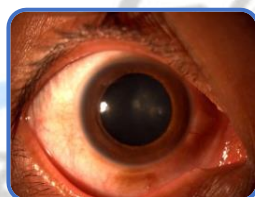
Antifungal

- Indications
 1. Fungal corneal ulcer
 2. Fungal retinitis/ Endophthalmitis
- Commonly used drugs are Natamycin & fluconazole



Mydriatics & Cycloplegics

- Dilate the pupil, ciliary muscle paralysis
- Classification:
 1. **Short acting**- Tropicamide (4-6 hours)
 2. **Intermediate**- Homatropine (24 hours)
 3. **Long acting**- Atropine (2 weeks)
- Indications
 1. Corneal ulcer
 2. Uveitis
 3. Cycloplegic refraction



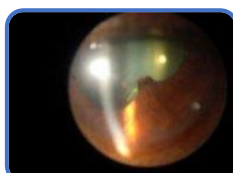
Cholinergic Medications

Cholinergic agonists

- E.g. pilocarpine
- Uses: miosis, glaucoma

Cholinergic antagonists

- E.g. tropicamide, cyclopentolate, homatropine, atropine
- Uses: funduscopy, cycloplegic refraction, anterior uveitis



Adrenergic agonists

Non-selective agonists (α_1 , α_2 , β_1 , β_2):

- E.g. epinephrine
- Uses: glaucoma

Alpha-1 agonists:

- E.g. phenylephrine
- Uses: mydriasis (without cycloplegia), decongestant

Alpha-2 agonists:

- E.g. brimonidine, apraclonidine
- Uses: glaucoma treatment, prophylaxis against IOP spiking after glaucoma laser procedures.

Alpha Adrenergic antagonists

Alpha-1 antagonist:

- Uses: to reverse pupil dilation produced by phenylephrine.
- Not widely used.

Antiglaucoma drugs

Beta blockers:

- Selective – betaxolol
- Non selective- timolol
- Mechanism of action:
 - Reduces aqueous humour production
 - Reduces IOP



Carbonic anhydrase inhibitors:

- Systemic: Acetazolamide
- Topical: Dorzolamide
- Mechanism of action: Reduce aqueous humour formation
- Side effects: (systemic administration)
 - Paresthesiae
 - Frequent urination
 - GI disturbances
 - Hypokalaemia

Prostaglandins:

- Latanoprost (0.005%)
- Bimatoprost (0.03%)
- Travoprost (0.004%)
- Mechanism of action: Increased aqueous out flow (through uveoscleral route)
- Side effects: conjunctival congestion, iris and periocular pigmentation, hypertrichosis, darkening of iris.

Osmotic agents:

- Dehydrate vitreous body which reduce IOP significantly
- E.g.
 - Glycerine 100% (cause nausea, hyperglycemia)
 - Mannitol 20% IV (cause fluid overload and not used in heart failure)

Anti-inflammatory agents:**Corticosteroids**

- Classification:
 - **Short acting:** Hydrocortisone, cortisone, prednisolone
 - **Intermediate acting:** Triamcinolone, Fluprednisolone
 - **Long acting:** Dexamethasone, betamethasone

- Indications for corticosteroids:

I. Topical

1. Allergic conjunctivitis,
2. Scleritis,
3. Uveitis,
4. allergic keratitis
5. After intraocular and extra ocular surgeries

**II. Systemic (pathology behind the Lens)**

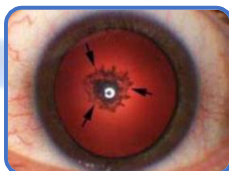
1. Posterior uveitis
2. Optic neuritis
3. Corneal graft rejection

N.B Never Give Steroid If You Are Suspecting Active Infection

- Side effects of corticosteroids:

A. Ocular:

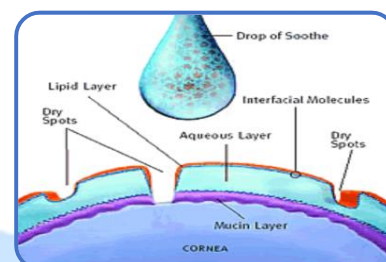
1. Glaucoma
2. Cataract
3. Activation of infection
4. Delayed wound healing

**B. Systemic:**

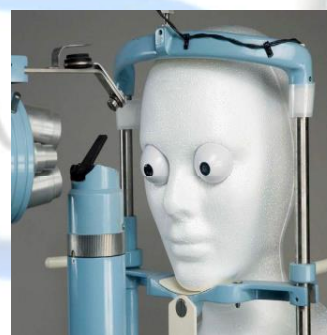
1. Peptic ulcer
2. Hypertension
3. Increased blood sugar
4. Osteoporosis
5. Mental changes
6. Activation of tuberculosis and other infections

Ocular lubricants

- Indication
 1. Ocular irritations in various diseases
 2. Dry eyes
- Commonly available commercial tear substitutes:
 - Refresh tears
 - Tears Naturale II

**Anti-allergics**

- Avoidance of allergens, cold compress & lubrications
- Antihistamines
- Decongestants (e.g. phenylephrine)
- Mast cell stabilizers (e.g. cromolyn)
- NSAID
- Steroids (e.g. fluorometholone)
- Drug combinations



Thank You

Uveal Tract

Dr. Horia Abdulla Alansi

Diseases Of Uveal Tracts

A. Congenital

1. Coloboma,
2. Aniridia,
3. Anisocoria ,
4. Albinism,
5. Torch Infection.

B. Trauma ($\pm$ adjacent structures injury)

1. Iris prolapsed or loss
2. Iridodialysis
3. Choroidal rupture or hemorrhage
4. Heterochromia in siderosis
5. Uveitis (focal or diffuse)
6. Embedded foreign body.

C. Inflammatory

1. Autoimmune/systemic
2. Infectious (viral. Bacterial, parasitic)

D. Tumors (the most common intraocular tumor in adults is the malignant melanoma).

E. Degeneration

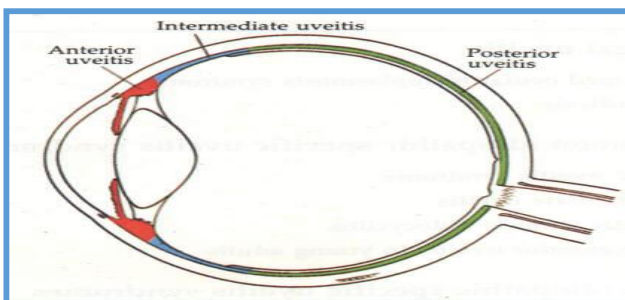
1. Pseudoexfoliation syndrome of the iris $\rightarrow$ glaucoma
2. Myopia :
 - a) Chorioretinal degeneration $\rightarrow$ scotoma
 - b) Lattice deg. $\rightarrow$ Retinal Detachment.
3. 2ry to inflammatory diseases, chorioretinitis.
4. Retinal disorders as retinitis pigmentosa.

Uveitis

Classifications

A. Anatomical

1. Anterior: iritis $\pm$ cyclitis
2. Intermediate: cyclitis
3. Posterior: choroiditis $\pm$ retinitis
4. Pan Uveitis e.g. Sympathetic uveitis Behce'ts disease.



- B. Clinical: Acute, Subacute, Chronic, recurrent, Complicated.
- C. Pathological: Non granulomatous / Granulomatous

D. Etiological: Exogenous / endogenous

1. Idiopathic
2. Traumatic: (blunt, penetrating, surgical, FB)
3. Infectious: (Viral, Bact., Fungal, TB, Sarcoidosis, Leprosy, protozoal (toxoplasmosis) parasitic (toxocarisis)
4. Local diseases: Keratitis , RD or Lens
5. Systemic diseases: HLA related Behcet's, sarcoidosis, GIT diseases as ulcerative colitis, skin diseases as psoriasis.
6. Masquerade syndrome: uveitis as response to hidden 1ry or 2ry tumors, FB inside the eye, Retinal Detachment.

Anterior Uveitis C/P:

Acute uveitis

Symptoms:

Acute red painful eye (D.D)

1. Photophobia
2. Reflex tearing
3. Deep ocular pain worsened by accommodation
4. $\downarrow$ VA
5. Floaters in v. Field
6. Hypopyon

Signs:

- A. Ciliary injection if $\uparrow$: miosis (iris spasm)
- B. Slit Lamp S/L:
 1. Cells & flare in AC (turbid aqueous)
 2. Fine keratic ppts or Kps. On endothelium
 3. Ant/posterior synechia $\rightarrow$ irregular fixed pupil.

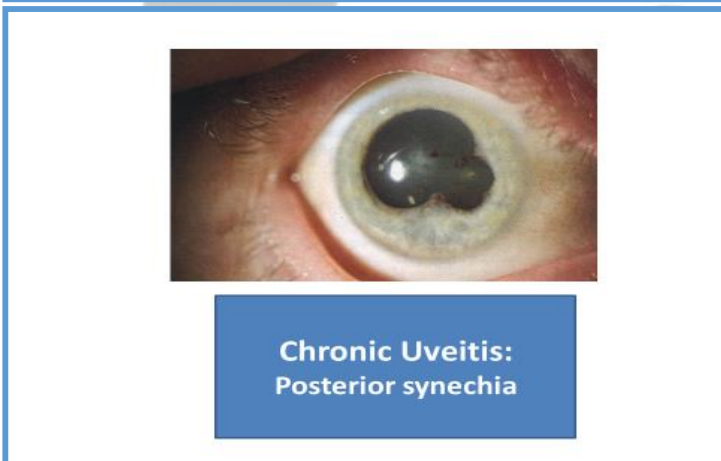
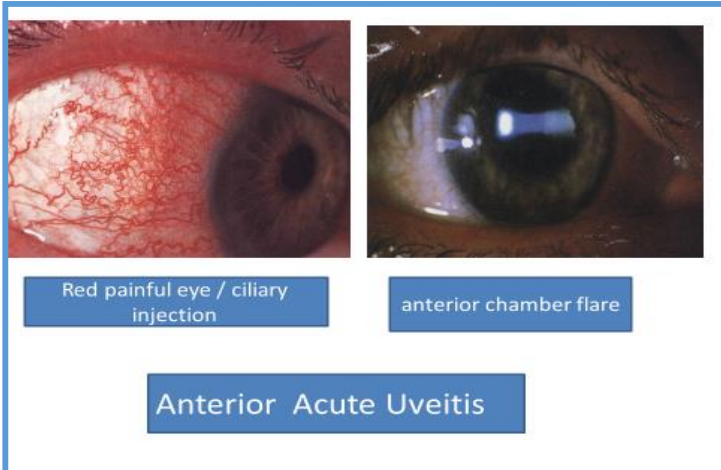
DD.

1. Acute glaucoma.
2. Keratitis.
3. Severe acute conjunctivitis.

Uveitis Sequel:

Anterior: painfull red eye, hypopyon, decreased vision +/- Glaucoma: from Hypopyon, synechia, cataract or band Keratopathy

Posterior: Painless, floaters in V. field, loss of part of the field, loss of vision if involve central retina (macula), retinal detachment, optic atrophy.



Posterior uveitis: C/P

1. No pain or redness,
2. V. Acuity if at the fundus
3. V. field if big & at periphery
4. Floaters (important symptoms).

S/L with lenses or ophthalmoscope: vitreous cells, exudates, vasculitis (BV- sheathing), dull grey retina or pigmentations (retinitis), focal multi-focal or diffuse choroiditis, neovascularisation → bleeding, fibrosis → RD or II- neuritis; both → II-atrophy.

Some systemic associated Uveitis: Reiters disease
Behcet's disease, Toxoplasmosis, Vogt Koyanagi Harada.

Reiter's Disease:

- A triad of urethritis, conjunctivitis and 'seronegative' arthritis
- Episode of peripheral arthritis > 1/12 with urethritis or cervicitis (HLA B27)
- Arthritis
- Entheses (planter fascitis ,Achilles tendonitis& calcaneal periostitis)
- Extra-articular features
- Ocular features : Conjunctivitis, Iritis, Keratitis

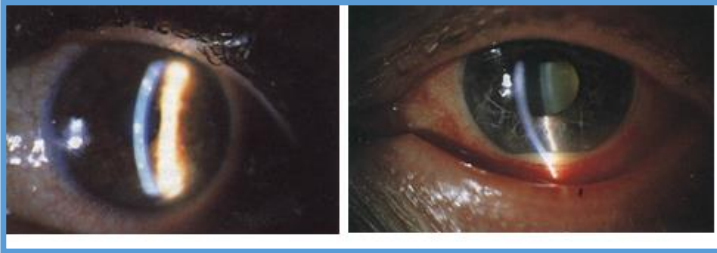
Behcet's Disease

- Idiopathic multisystem disorder that causes inflammation of the blood vessels (occlusive vasculitis leading to hemorrhagic retinal infarction). The basic lesion is an obliterative vasculitis probably caused by abnormal circulating immune complexes. (HLA B5)
- Acute iritis with hypopyon
- Oral ulceration
- Genital ulceration
- Skin lesion



Ocular Features of Behcets' Disease:

1. Recurrent acute iritis
2. Chronic iridocyclitis
3. Retinal vasculitis
4. Retinal hemorrhage
5. Macular edema
6. Ischemic optic neuropath
7. Vitritis.



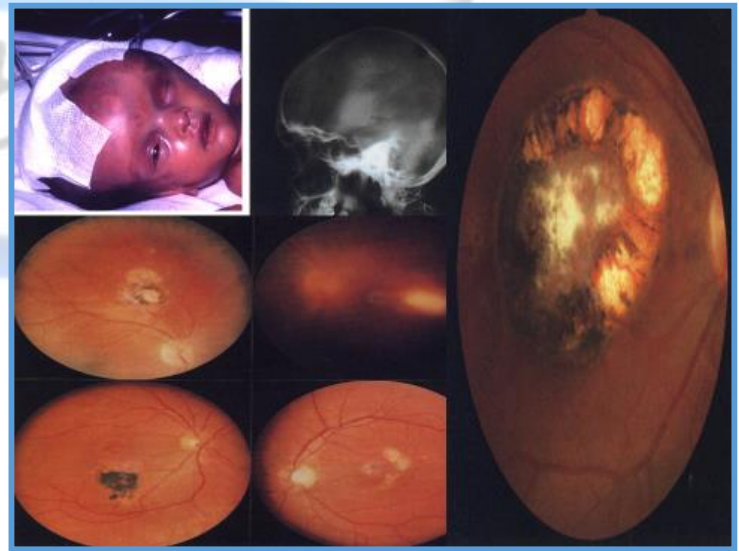
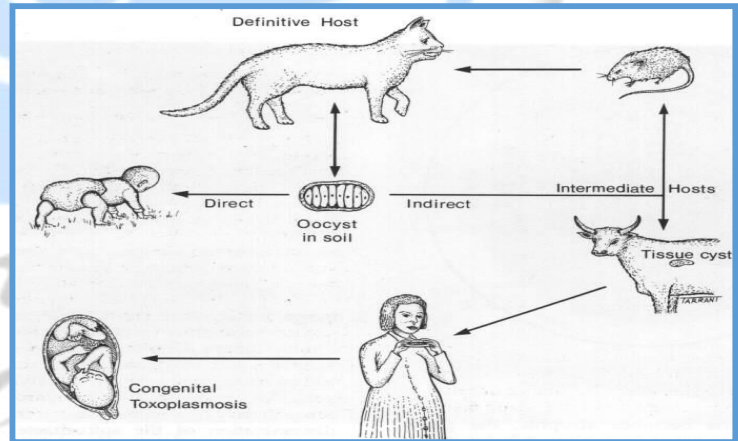
Vogt Koyanagi Harada Syndrome

- It is an idiopathic, multisystem disorder which typically affects pigmented individuals.
- Increased prevalence of HLA-DR4 and DW15.
- **Ocular features of VKH:**
 1. Chronic granulomatous iridocyclitis.
 2. Multifocal choroiditis which may be associated with disc hyperaemia or oedema.
 3. Development of multifocal detachments of the sensory retina at the posterior pole.
- **Features of VCH**
 - A. **Skin and hair changes include the following:**
 1. Alopecia
 2. Poliosis
 3. Vitiligo
 - B. **Neurological features**
 1. Irritation
 2. Encephalopathy
 3. Auditory symptoms include tinnitus, vertigo and deafness.
 4. Cerebrospinal fluid lymphocytosis.



Toxoplasmosis:

- TG intracellular protozoan
- Ways of infection:
 1. Ingestion of uncooked meat (bradyzoites).
 2. Ingestion of sporocytes from dirty pica .
 3. Transplacental Spread (tachyzoites)



▪ **Treatment:**

• **Indication:**

- 1) Macular oedema
- 2) If the visual acuity has fallen to less than 6/12

• **Anterior uveitis:**

1. Topical steroid
2. Cycloplegic (atropine): ↓ the CB spasm , analgesics, and prevent synechia.

• **Medical consultation if there is no local cause or trauma.**

• **Specific anti microbial.**

• **FOR Glaucoma: medical ttt or trabeculectomy.**

• **Cataract: Extraction.**

• **Posterior uveitis: - Systemic steroid / local injection, antimicrobial and cytotoxic drugs as in Behcet's diseases.**

• **Treat complications as retinal detachment.**

اللجنة العلمية Group C



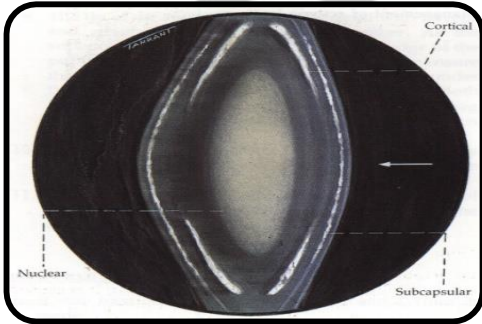
Thank You

Cataract

Dr. Mutahar Al-Shaer MD
Sana'a University

Applied anatomy

- Transparent ,biconvex structure of crystalline appearance placed between vitreous and iris.
- Refractive index
- Diopetric power
- Diameter
- Thickness
- Weight
- Parts :capsule,cortex,nucleus.



Functions

1. To provide refractive power to the optical system
2. Accommodation for near vision
3. Absorption of harmful light

Diseases of the lens

1. Cataract
2. Dislocation and subluxation
3. Congenital anomalies

Cataract

- Any opacity of the lens or it's capsule either congenitally or acquired.
- Classification:
 1. Congenital:punctate,zonular,coronary,anterior polar,posterior polar etc.
 2. Acquired:senile,complicated(local-systemic),traumatic,drugs,etc

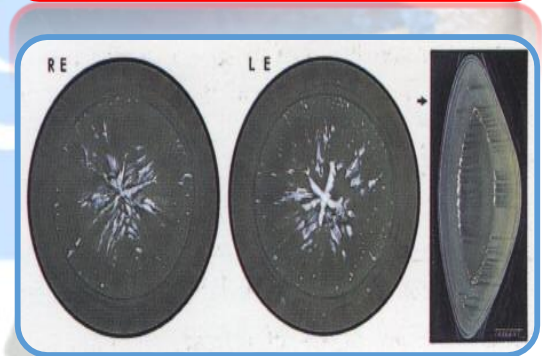
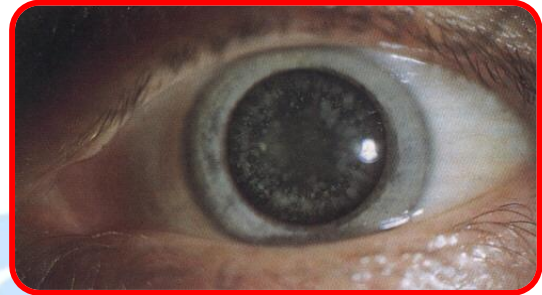
Congenital cataract

- Etiology:
 1. Maternal malnutrition
 2. Maternal infection
 3. Deficient oxygenation

- Symptoms: depend on size, shape
- If severe there is marked visual impairment, leukokoria, nystagmus, squint.

Signs:

1. White reflex
 2. Black opacity against red reflex
 3. Systemic congenital anomalies may seen
- Clinical types



Treatment of congenital cataract

1. No treatment
2. Mydriasis
3. Surgical treatment

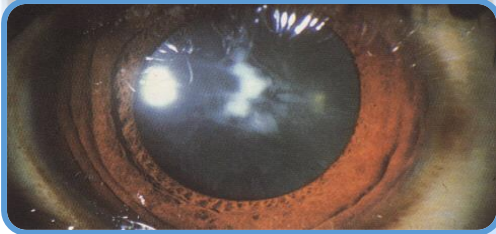
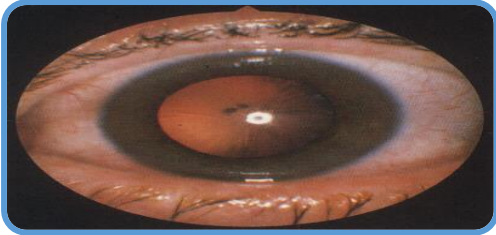
Acquired cataract

1. Senile Cortical Cataract

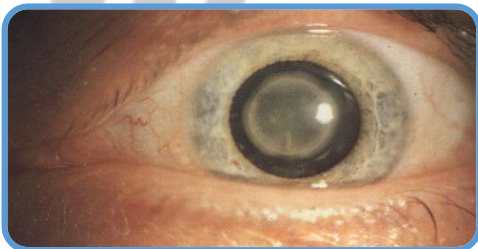
- It is the most common type of senile cataract
- Etiology:it is due to degeneration of the lens fibers either due to"
 1. Hydration
 2. Denaturation and coagulation of lens proteins
- Incidence:>50 years.both sexes affected equally,usually bilateral.
- Clinical stages:
 1. Immature cataract:
 - Lamellar separation
 - Inciepient
 - Intumescent
 2. Mature cataract
 3. Hypermature and morgagnian cataract

Immature cataract

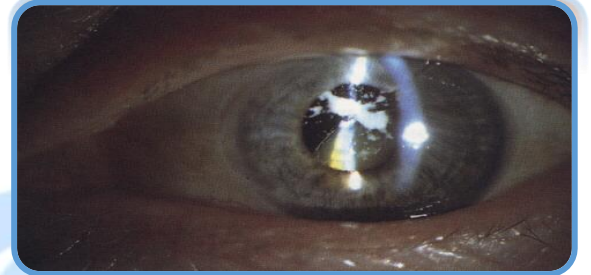
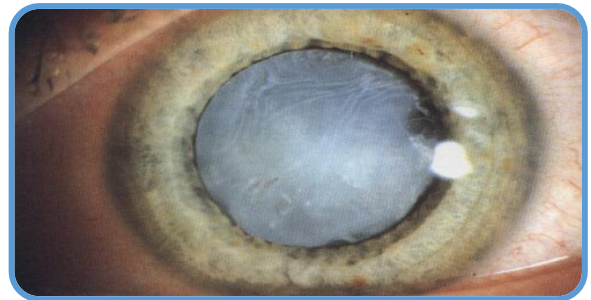
- There is demercation of lens fibers
- Gray appearance of the pupil
- Polyopia
- Visual acuity impaired
- Coloured halos

**Mature cataract**

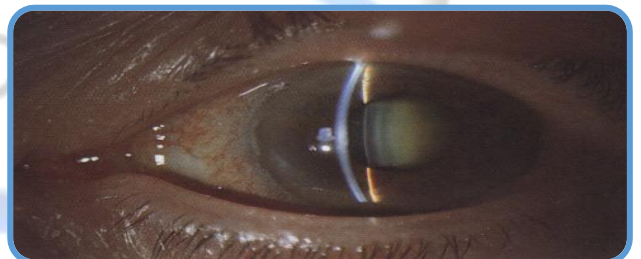
- Entire cortex is opaque
- Iris shadow test negative
- Red reflex negative
- Visual acuity severely deteriorated

**Hypermature cataract**

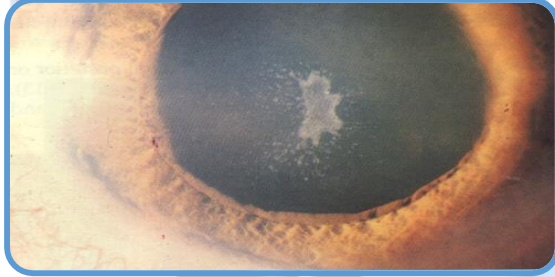
- Cortex become fluid
- Nucleus becomes small, sinks by gravity in the bag of liquified cortex
- Anterior capsule become thick, wrinkled
- Iridodonesis
- Deep A/C
- Subluxation, dislocation
- Phacolytic glaucoma

**2. Senile Nuclear Cataract**

- There is sclerosis of the central nuclear fibers, the cortical fibers remain transparent.
- Incidence: >40
- **Clinical stages:**
 1. Black cataract (cataracta nigra)
 2. Then cloudiness spread to cortex
 3. Mature: all lens become nucleous, progressive myopia
 4. Hypermature NOT occur as the process is very slow.
- Symptoms: visual impairment due to progressive myopia, central opacity.
- Signs: blackened pupillary reflex, hazy media.

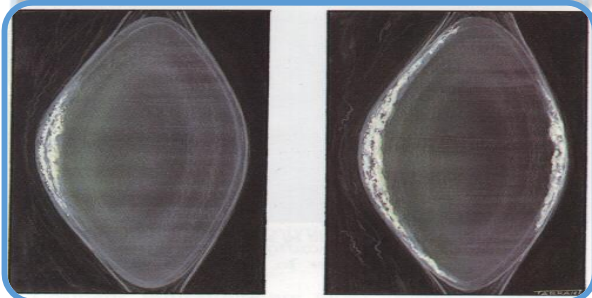
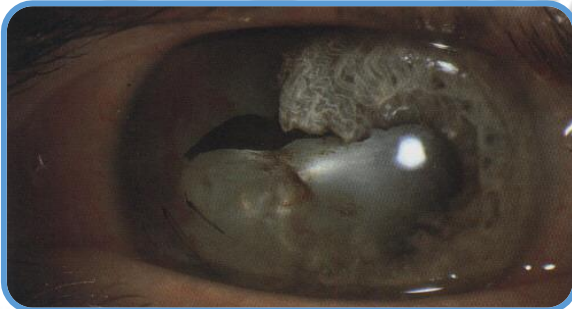
**Complicated cataract**

- It occurs as a result of systemic disease or local eye disease.
- Local diseases:
 1. Inflammatory diseases: iridocyclitis, choroiditis
 2. Degenerative diseases: high myopia, retinal detachment, retinitis pigmentosa
- Systemic diseases: DM, parathyroidism, myotonic dystrophica, atopic dermatitis



Other causes of acquired cataract

1. Traumatic cataract
2. Toxic cataract



Symptoms of acquired cataract

Early:

1. Black spots in front the eyes(muscae volitants)
2. Uniocular diplopia
3. Coloured halos

Late:

1. Peripheral opacity
2. Central opacity
3. Progressive myopia
4. Last there is severe affection of visual acuities may reach to PL.

Signs of acquired cataract

1. White pupillary reflex(leucocoria),D/D
2. Change in red reflex
3. Refractive errors:as myopia in nuclear cataract

Preoperative investigations

General conditions-eye conditions should be assessed before operation.

1. Examination of the eye:
 - Pupillary reactions
 - Visual acuity
 - IOP
 - Lacrimal apparatus
2. Systemic examination:DM,HPR,CVS,gross septic foci
3. Fundus examination:if seen-if not seen

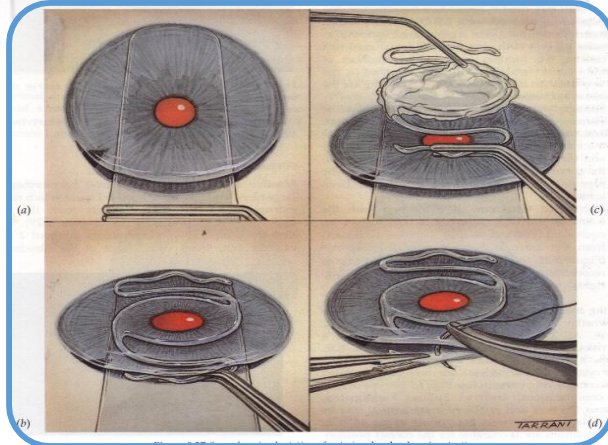
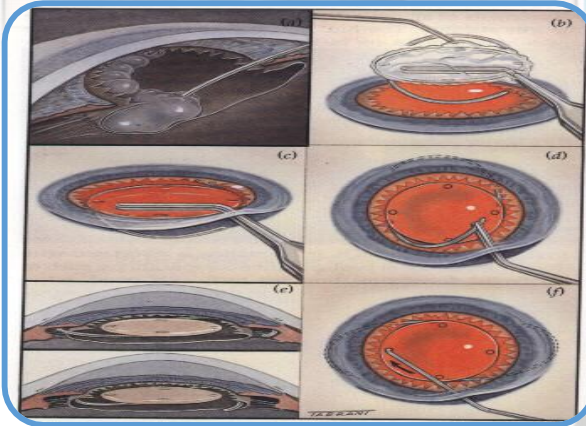
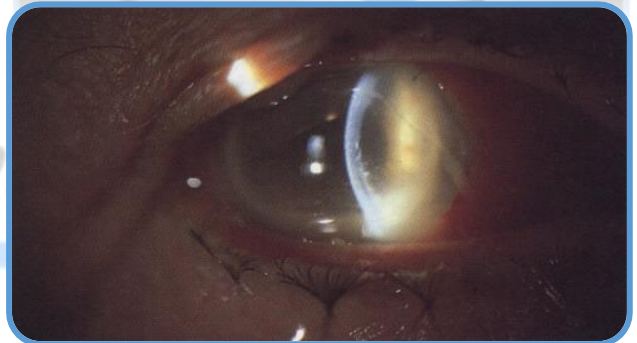
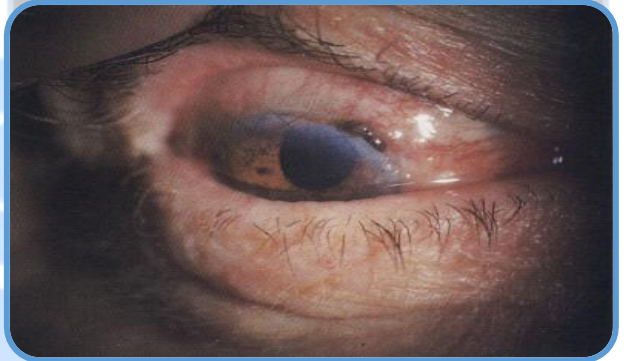
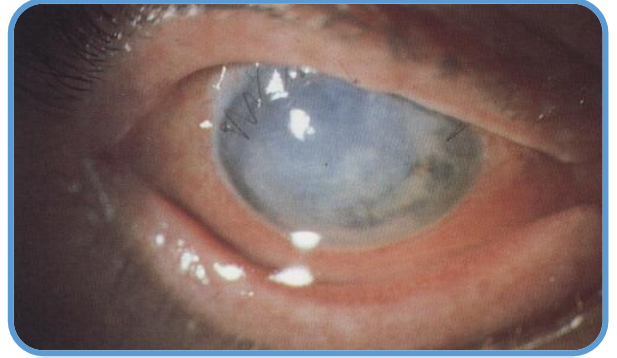
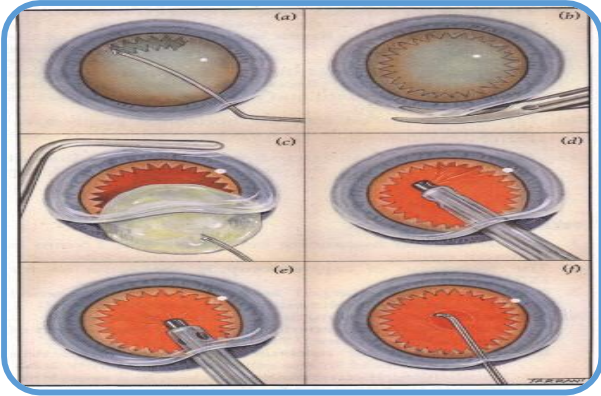


Indications for cataract surgery

- A. Visual improvement
- B. Medical causes:
 1. Phacolytic glaucoma
 2. Phacomorphic glaucoma
 3. Retinal diseases

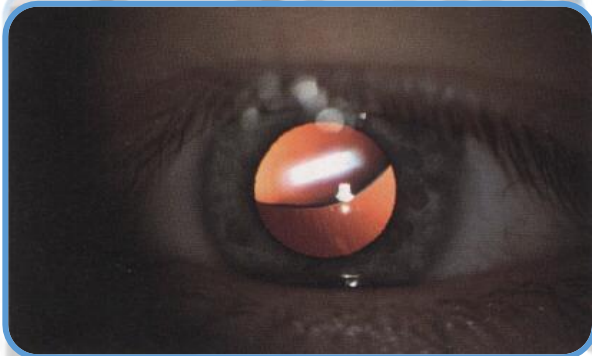
Treatment of cataract

- A. Medical treatment:no
- B. Surgical treatment:
 1. ICCE
 2. ECCE
 3. ECCE+PCIOL/ACIOL
 4. PHACOEMULSIFICATION
 - Preoperative preparation
 - Operative complication
 - postoperative complication: early-late



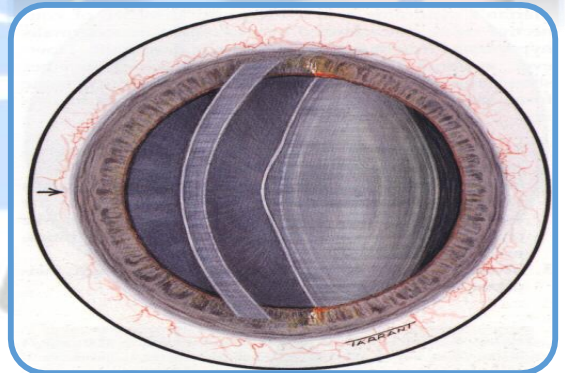
Dislocation Of The Lens

- The lens is displaced from it's normal position due to partial or complete rupture of the zonule.
- Etiology:
 1. Congenital:eg.,Marfan syndrome,homocystenoria,Marchesani syndrome
 2. Traumatic dislocation.
- Types:
 1. **Complete**
dislocation:posterior,anterior,subconjunctival,outside the eye.
 2. **Partial(Subluxation)**



Congenital Anomalies

1. Coloboma of the lens
2. Ectopia lentis
3. Lenticonus



OCULAR EMERGENCIES

Dr. Sameha Aleryani

Ocular Emergencies

- Traumatic
- Non-traumatic

TRAUMATIC

- Subconjunctival hemorrhage
- Corneal abrasions
- Foreign bodies
- Blowout fractures
- Hyphema
- Traumatic retinopathies
- Optic nerve trauma
- Lacerations of the lid, cornea, sclera
- Chemical burns

Diagnostic workup of ocular emergencies

- Past ocular trauma
- Prior surgical history, illnesses, allergies and medications
- Preexisting visual impairment
- Use of glasses or contact lenses (if used, type, duration of use)
- Onset of complaint and associated symptoms (e.g., degree of discomfort, visual changes, redness, discharge)
- Time, place, activity, and circumstances under which the injury occurred
- Treatment rendered prior to admission

DIAGNOSTIC WORKUP OF OCULAR EMERGENCIES

- **Visual acuity:** Check with and without glasses, using Snellen chart or other means
- **Lids/adnexa:** Evaluate position of the lid, contour, color, and periocular areas; check for evidence of lesions, edema
- **Slit lamp:** Best for evaluating anterior structures (e.g., cornea, conjunctiva, anterior chamber, iris, lens)
- **Goldmann applanation:** Measures intraocular pressure (also Schiottz tonometry, Tono-pen)
- **Pupils:** Evaluate size, shape, ability to respond to direct and consensual light
- **Orbit:** Inspect orbits for symmetry and proptosis; palpate the orbital rim for "step-offs," and mobility.

Orbital fractures are generally the result of blunt trauma

- **Motility:** Check for with cranial nerves III, IV, VI (restriction or paresis of these muscles may cause diplopia)
- **Fundusoscopic exam:**
 - Best for evaluating optic nerve, retinal vessels, retina
 - Pupils may be dilated or undilated
 - Contraindicated in patients who have an iris supported intraocular lens or untreated narrow angle glaucoma
- **Fluorescein staining:** Increased dye uptake is indicative of damage to the corneal epithelial cells

Approach to ocular trauma

- Often in setting of multi-system trauma, therefore, ABC's...
 - Considerations for early management:
 - Avoid manipulation of eye
 - IV Abx – broad spectrum
 - Tetanus prophylaxis
 - Anti-emetics
 - Remember - visual acuity, pupillary responses, visual fields, etc.
- Early ophthalmology consultation
 - CT is the imaging study of choice

Injuries after blunt trauma to eye

- Blow out fracture of orbit
- Corneal abrasion
- Anterior hyphema
- Lens dislocation/subluxation
- Traumatic mydriasis
- Vitreous hemorrhage
- Retinal detachment
- Traumatic iritis
- Ruptured globe

TRAUMA

1. Eyelid

- Haematoma
- Margin laceration
- Canalicular laceration

2. Orbital blow-out fractures

- Floor
- Medial wall

3. Complications of blunt trauma

- Anterior segment
- Posterior segment

4. Complications of penetrating trauma

5. Management of intraocular foreign bodies

6. Chemical injuries

Conjunctival F.B.s

- Foreign bodies often lodge behind the superior tarsal plate
- Remove under topical anesthesia using a sterile cotton-tip applicator moistened with saline
- Instill topical antibiotic

Corneal foreign body



Corneal F.B.s

- Remove under slit lamp control to assess depth of penetration
- If the body or its removal causes a small corneal abrasion, treat accordingly
- Metallic foreign bodies may leave a rust ring; remove immediately or wait 18-36 hours for the ring to soften
- If there is a residual rust ring, treat the injury as a corneal abrasion and refer to specialist

Corneal Abrasions

- **Etiology:** Debris (e.g., paper, fingernail, contact lens) falling into the eye

- **Clinical presentation:**

- Pain, which may be severe
- Photophobia
- Conjunctival injection
- Blepharospasm
- Foreign body sensation

- **Diagnostic workup:**

- History reveals source of corneal trauma
- Inspection of eye may reveal foreign body
- Fluorescein outlines the defect under Wood's lamp

- **Clinical management:**

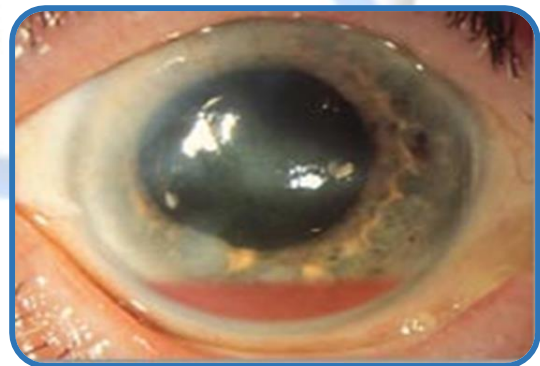
- Topical anesthetics (e.g., proparacaine, tetracaine) provide immediate relief
- Pressure patch for large abrasions or severe pain
- Daily checkups
- Referral to ophthalmologist if healing does not occur or infected

Corneal abrasions



Hyphema

- **Definition:** Blood in the anterior chamber
- **Etiology:** Usually blunt eye trauma



Hyphema - Diagnostic workup:

- Pain
- Blurred vision
- Red eye

- Somnolence, especially in children
- Blood layered along the dependent portion of anterior chamber
- Blood cells may appear suspended in anterior chamber (microhyphema)
- Sluggish pupil or peaked pupil due to clotting of blood
- Possible iris tears or active iris vessel bleeding

Complications:

Increased intraocular pressure, corneal blood staining, re-bleeding

Clinical management:

Immediate referral to ophthalmologist

Subconjunctival Haemorrhage

■ Diagnostic workup:

- “Bloody eye”
- Usually no pain or blurred vision

■ Clinical management:

- Reassurance that effect will clear in 2-3 weeks
- If trauma-induced with possible hyphema or ruptured globe, refer to specialist

■ **Definition:** A collection of blood in the subconjunctival space following rupture of a subconjunctival vessel

■ Etiology:

- Blunt trauma to the eye
- Valsalva's maneuver (e.g., coughing, straining with heavy lifting, constipation)
- Accelerated HTN
- Bleeding disorders or anticoagulants

Subconjunctival Haemorrhage



Eyelid haematoma

Usually innocuous but exclude associated trauma to globe or orbit



Orbital roof fracture if associated with subconjunctival haemorrhage without visible posterior limit



Basal skull fracture - bilateral ring haematomas ('panda eyes')

Canalicular laceration

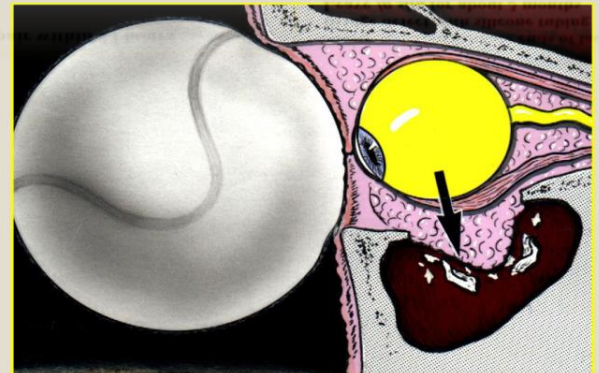


• Repair within 24 hours



- Locate and approximate ends of laceration
- Bridge defect with silicone tubing
- Leave *in situ* for about 3 months

Pathogenesis of orbital floor blow-out fracture



Signs of orbital floor blow-out fracture



- Periocular ecchymosis and oedema
- Infraorbital nerve anaesthesia

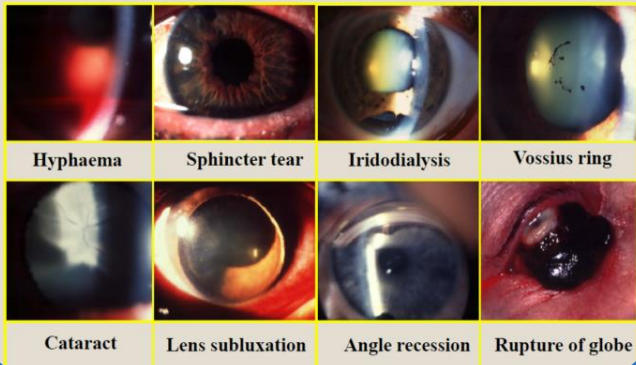


- Ophthalmoplegia - typically in up- and down-gaze (double diplopia)

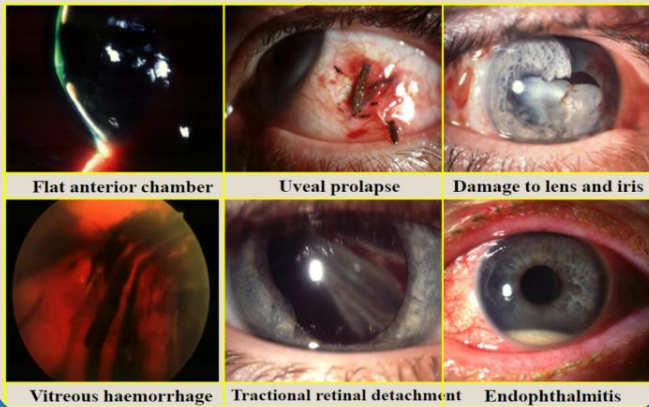


- Enophthalmos - if severe

Anterior segment complications of blunt trauma



Complications of penetrating trauma



Management of intraocular foreign bodies

